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ABSTRACT

This resource book contains mathematical games, tricks, and quick activities for the classroom. Categories include place value, number lines, basic facts and computation, computation and calculator practice, puzzles for tricky thinkers, and geometry. Ten classroom games and activities are found in the place value and number line sections, 27 problems in the basic facts, computation, and calculator sections, and 17 puzzles and six geometry tricks and activities are also provided. A key to each of the 60 activities, games, and tricks is included. (DDR)

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SCRATCH YOUR BRAIN WHERE IT ITCHES

BOOK A-1

MATH GAMES, TRICKS & QUICK ACTIVITIES

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Scratch Your Brain Where It Itches A-1

Math Games, Tricks, and Quick Activities

LINDA BRUMBAUGH

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PLACE VALUE

1. Construct "giant" dominoes out of construction paper. (For overhead dominoes, use rectangles of construction paper with holes punched to resemble domino dot patterns.) Distribute the giant dominoes to students. Write a numeral on the board and ask students to stand if they have the domino with that sum.

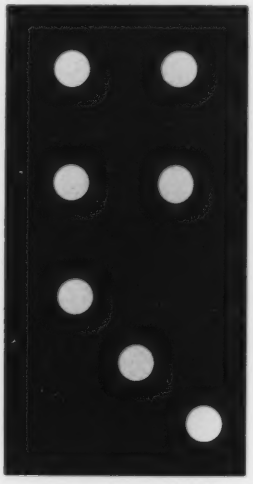
   VARIATION: Have students hold up the domino if they think they have a solution.

   VARIATION: Students identify the dot sum that is one less or one more than the dot sum shown.

   VARIATION: Have students place the overhead dominoes in order according to the sum of the dots—from least to greatest or from greatest to least.

   VARIATION: Use the overhead dominoes to practice addition facts or to model families of related facts. For example, the domino shown has a total of 7 dots. One side has 3 dots, and the other side has 4 dots. The sum is 7. Write the facts (2 addition facts and 2 subtraction facts) for the three, four, and seven fact family.

   VARIATION: Find products instead of sums.



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2. A caller gives a place value clue, such as, "I'm thinking of a number that has 6 hundreds, 3 tens, and 5 ones." The caller chooses another student into write the numeral on the board (635). If successful, this student becomes the caller.

VARIATION: Divide the class into teams by rows, etc. The teacher is the caller. Points determine the winning team.

VARIATION: Use 4-digit numbers.

3. Roll die to determine the number of digits in a target numeral. The first role gives the number of digits, for example. A "3" would indicate a 3-digit value. The next roll will be greatest place value—hundreds place for this number. A third roll gives the tens place, etc. Partners take turns rolling. The winner has the number with the greatest (or least) value.

VARIATION: The first roll determines the number of places for the target number. Other rolls may be placed as players see fit to gain greatest (or least) number.

VARIATION: Use a set of dice. Roll to the thousands place.

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4. This activity is for 1–4 players and requires 1 die numbered 0–5, base-ten blocks, score pad and/or calculator. For each roll of the die, the player receives that number of unit cubes (ones). The first to build a ten wins.

   VARIATION: Play to 20, 30, 40 etc.

   VARIATION: Use base-ten blocks (unit/cubes, ten/longs, and hundreds/flats). Play as above. When 10 units are collected, they are traded for a long (ten) block. Goal: Build a hundred first.

5. Make a card for each student in the class or give one card to each pair of student partners (see pages 4–8) . The first student reads his/her card. For example, "I have 15. Who has a number with a 4 in the tens place?" The game continues until the second to the last student reads a card that is answered with the first reader's number (in this case, 15).

   NOTE: Care should be taken to avoid duplicating the cards. (Use the blanks on page 8 to make up your own additions to the game.) However, if there are multiple answers to the question, the first student answering correctly continues.

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I have 15.
Who has a number with a 4 in the tens place?

I have 40.
Who has a number with an 8 in the ones place?

I have 28.
Who has a number with a 7 in the tens place
and a 0 in the ones place?"

8

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I have 70.
Who has a card with a 3 in the tens place and the number of fingers, plus the thumb on one hand in the ones place?

I have 35.
Who has a card where the sum of the digits is 3?

I have 12.
Who has a card with the sides of a triangle in the tens space and the sides of a square in the ones space?

9

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I have 34.
Who has the card that tells the number of tens in 29?

I have 2.
Who has the card that has the number of days in a week?

I have 7.
Who has the card with the number that is one less than 10?

10

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I have 9.
Who has the card that tells how many things are in a dozen?

I have 12.
Who has the card that is 1 more than 71?

I have 72.
Who has the card with 1 ten and 5 ones?

11

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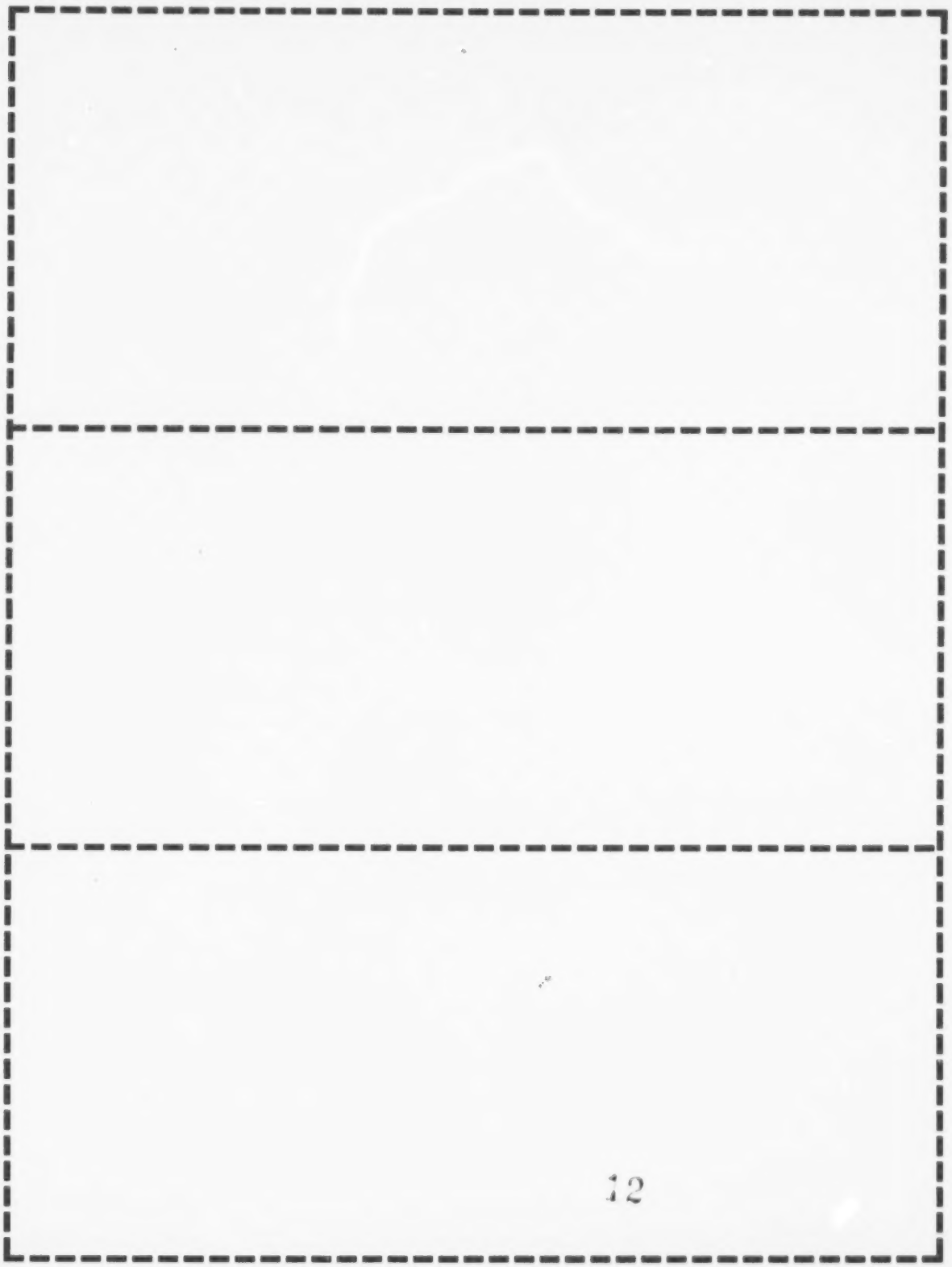
Use these blank cards to make your own exercises to add to the game.



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6. A leader writes a mystery number that is between 1 and 100. Volunteers take turns guessing the number. If a guess is greater than the mystery number, the leader raises both arms. If the guessed number is less than the mystery number, the leader squats. The student who identifies the mystery number becomes the leader.

7. A set of cards numbered 1 through 10 is dealt to two players (see pages 10–13). The players decide who will be "odd" and who will be "even." Each player turns over one card. If the sum of the cards is odd, the "odd" player gets the cards. If the sum of the cards is even, the "even" player gets the cards. The game continues until one player has no cards.

   VARIATION: Find the difference of the values on the cards.

   VARIATION: Find the product of the values on the cards.

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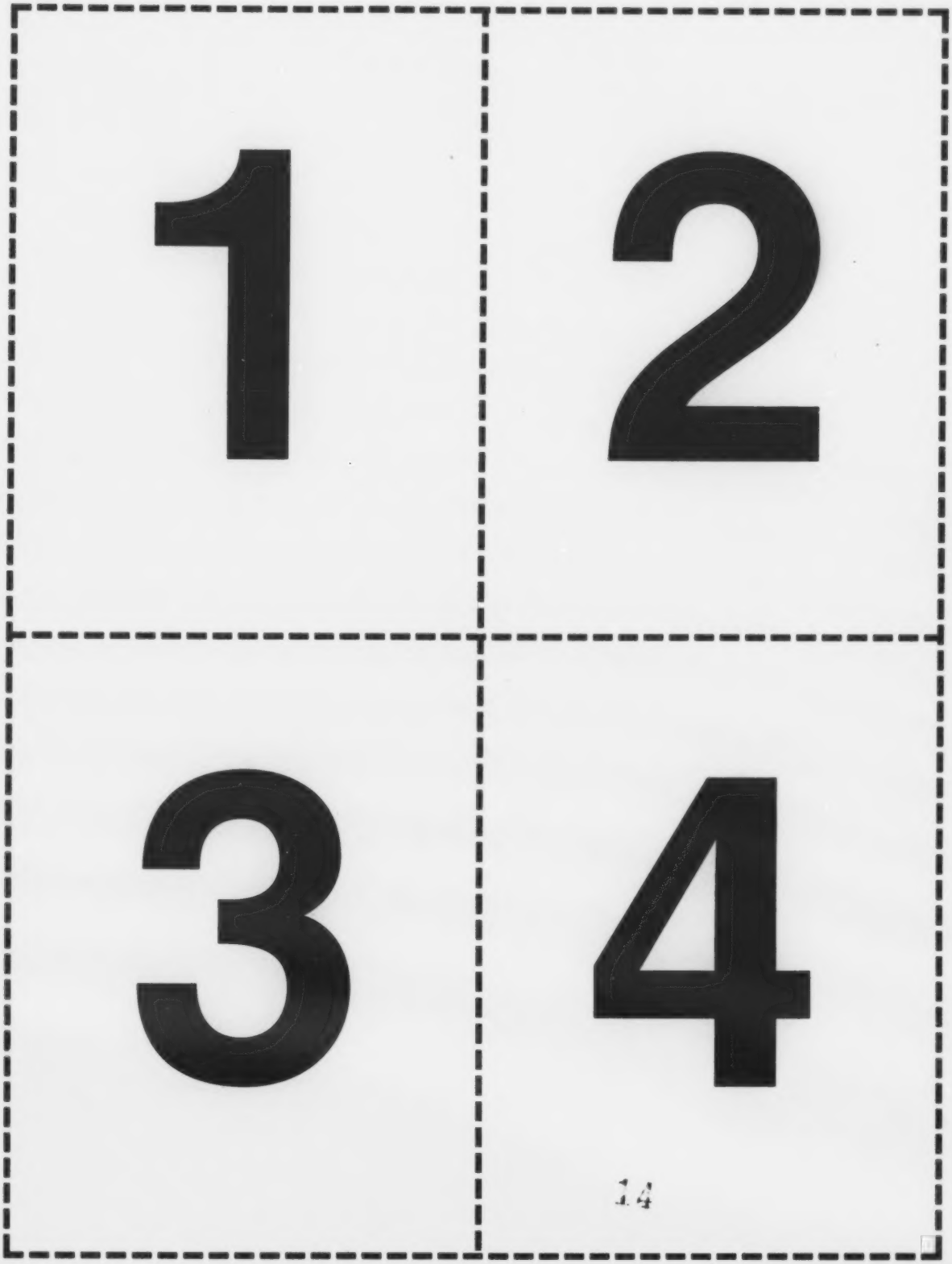

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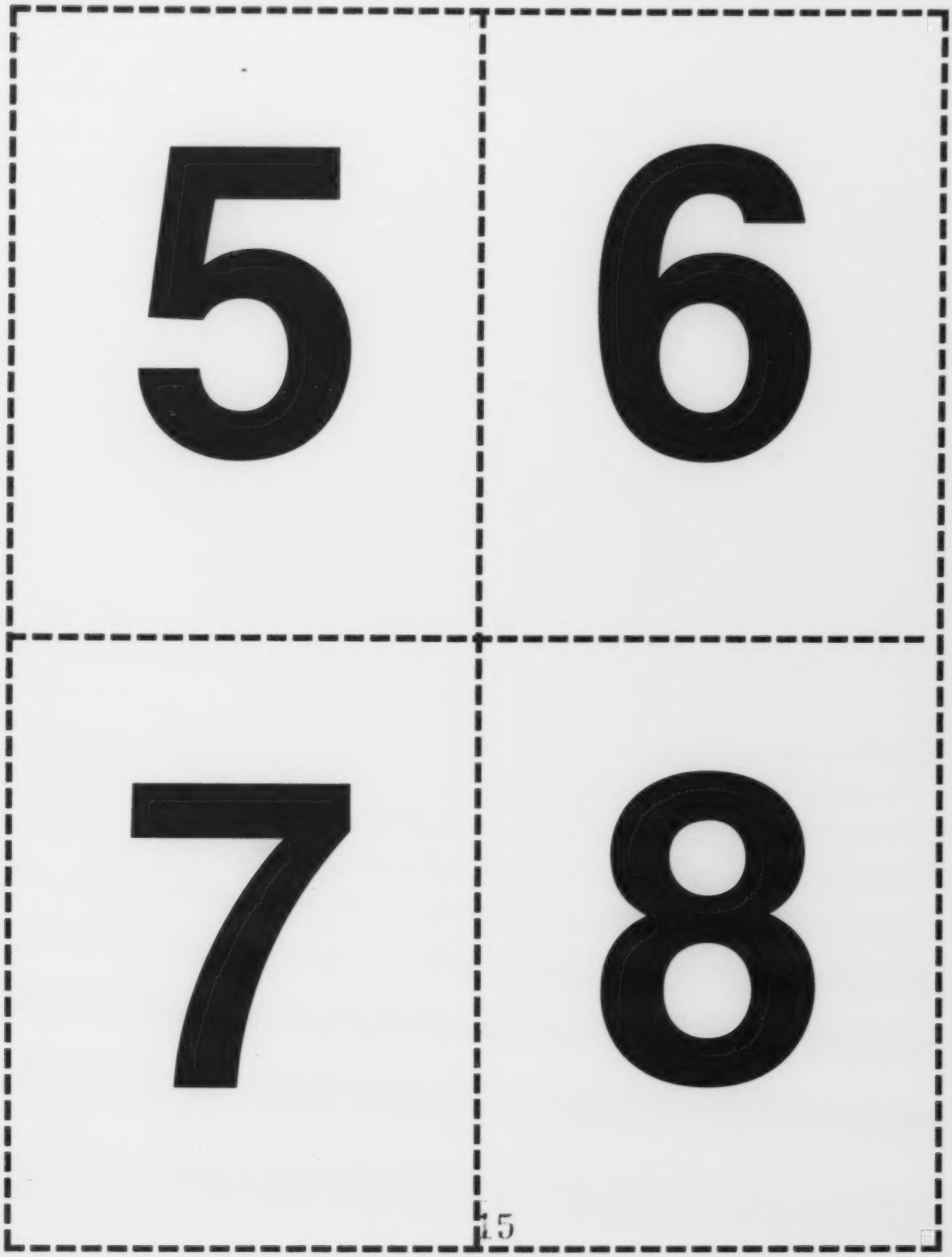

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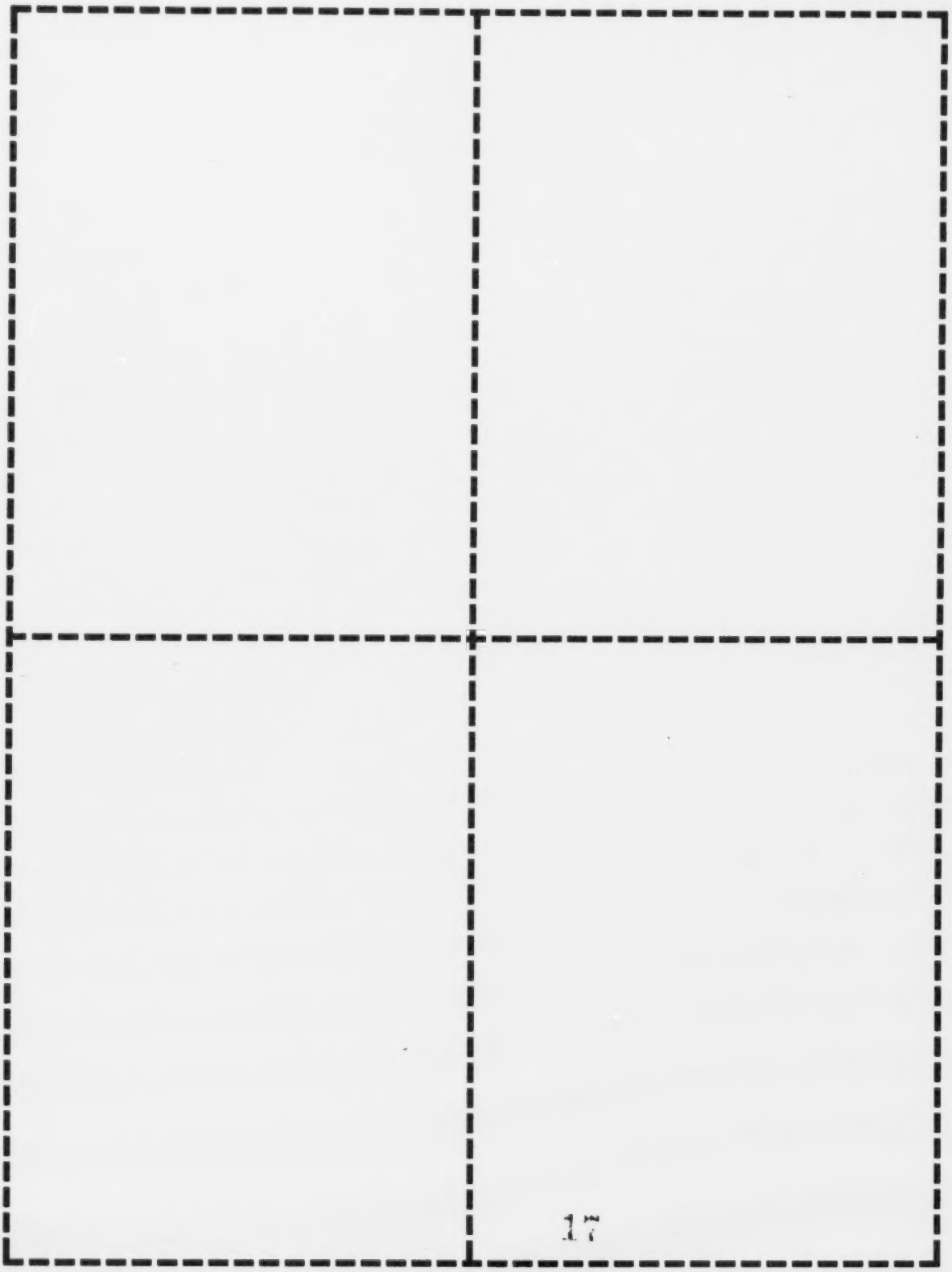

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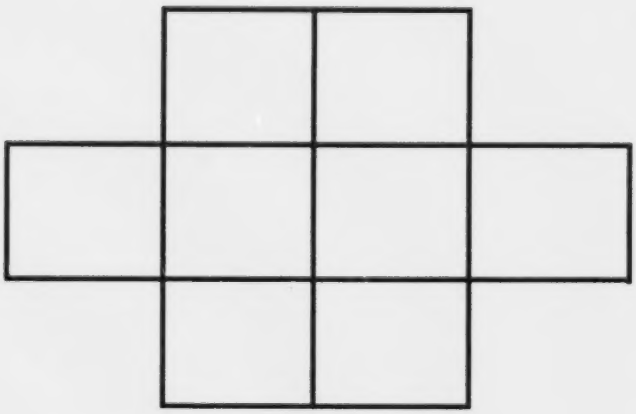
8. Students stand one behind the other in front of the class and proceed as follows: The teacher says, "Last person, stand on one foot. The fourth student from the front will raise a hand. The fifth person from the back please clap your hands. The third person from the front, return to your seat. Continue in this manner. Vary by adding players or changing commands to add difficulty.

9. Arrange the numbers 1–8 in the boxes so that no number is touching another number that is one greater or one less. A touch is either horizontal, vertical, or diagonal (for example, 3 cannot touch 2 or 4).



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10. Use jump rope rhymes and bouncing balls for counting, skip counting, exercise, coordination, and fun for individuals, partners, or the whole group in unison.

RHYME 1
I love stories and love reading.
How many books will I be needing?
1, 2, 3, 4,... (or 2, 4, 6, 8)

RHYME 2
Teacher, teacher
Hear me (us) count.
Will I reach the greatest amount?
5, 10, 15, 20...(vary the count)

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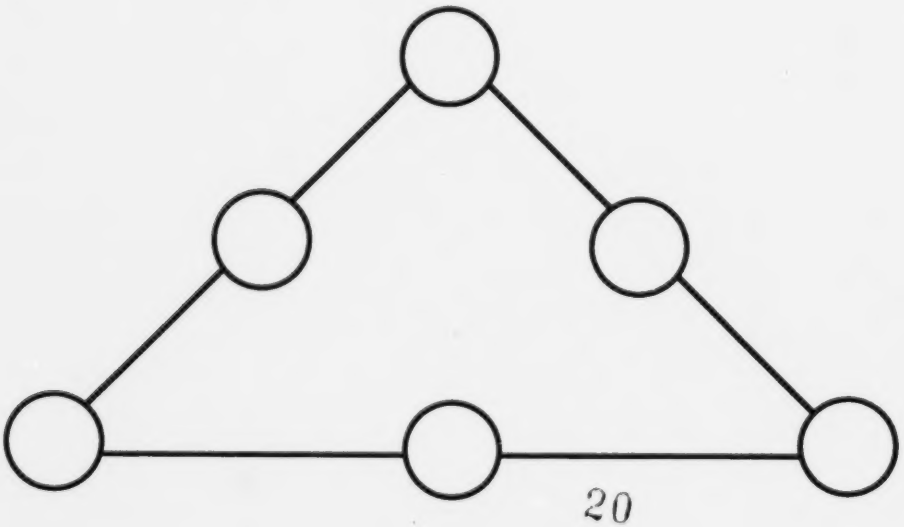
11. Students respond only to statements prefaced with "Simon says," or they are out of the game. For example, they would respond to "Simon says 4 + 8 = ?" but not to "4 + 8." Vary the game by inserting statements that only require an action, like, "Simon says touch your knees!"

VARIATION: Use other operations.

12. Place the digits 1, 2, 3, 4, 5, 6 in the circles so that the sum of each side of the triangle is 10.

VARIATION: Find the sum of 11 or 12.



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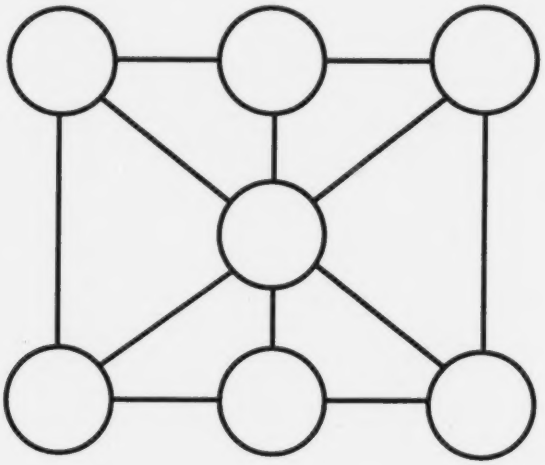
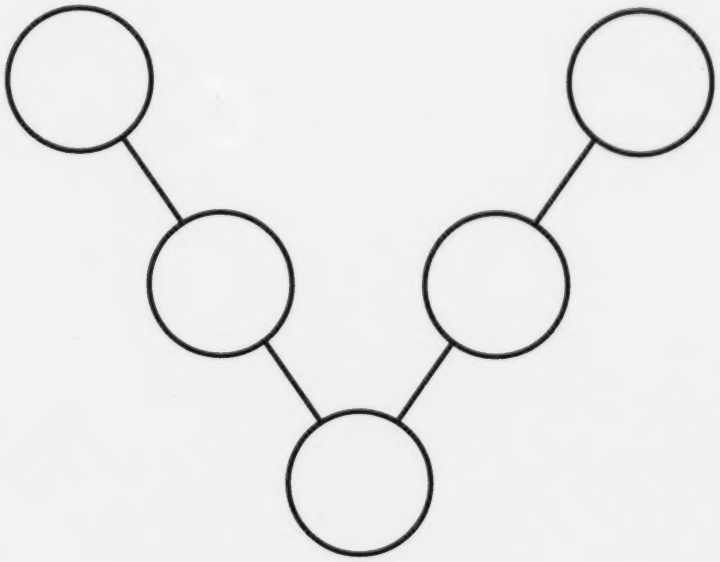
13. Use 1, 2, 3, 4, 5, 6, 7 to fill in the circles so that the sum of any row, column, or diagonal will be 12.



14. Put a digit in each circle so the sum of the digits on each side of the "V" is 8.



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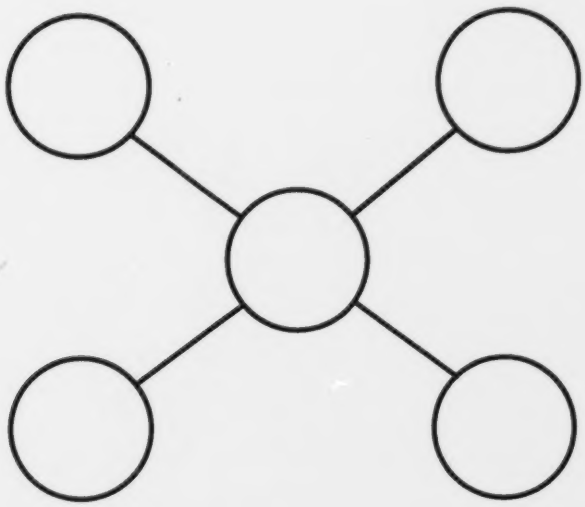
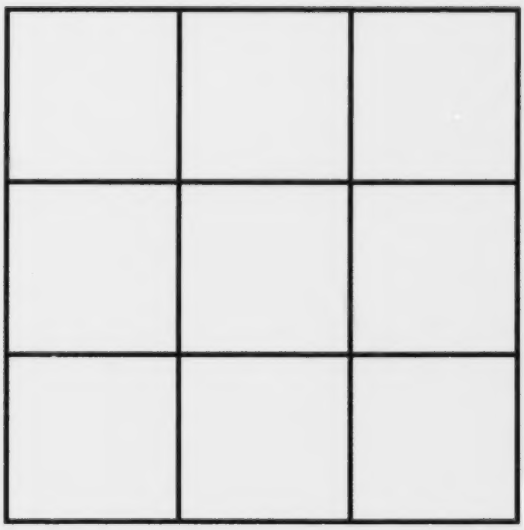
15. Put a digit in each circle to get a sum of 9 in each diagonal.



16. Use 1 through 9 to fill in the cells so each horizontal, vertical, and diagonal row has a sum of 15.



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17. Students sit in a circle or semicircle. Count the number of students and divide this sum by two. Assign numbers from 2 to the number of students sitting in the group, with each number being used twice. A student leader calls out an addition fact, such as 7 + 5, and the two students who were assigned 12 must exchange places before the leader can get to one of their places. If the leader succeeds, the student without a place becomes the new leader. The old leader is given that student's number. Proceed until all possible sums have been called.

18. You will need construction paper, markers, and glue for this activity. Each student receives or constructs a paper headband. Display construction paper feathers (see template page 20) so students can see them and have access to them. Write one basic fact on each feather. Students may take turns winning feathers for their headbands by accurately solving facts. When all feathers have been won, students may glue them to their headbands and wear their winnings. The students with the most feathers is Facts Chief or Chief of Facts for the day.

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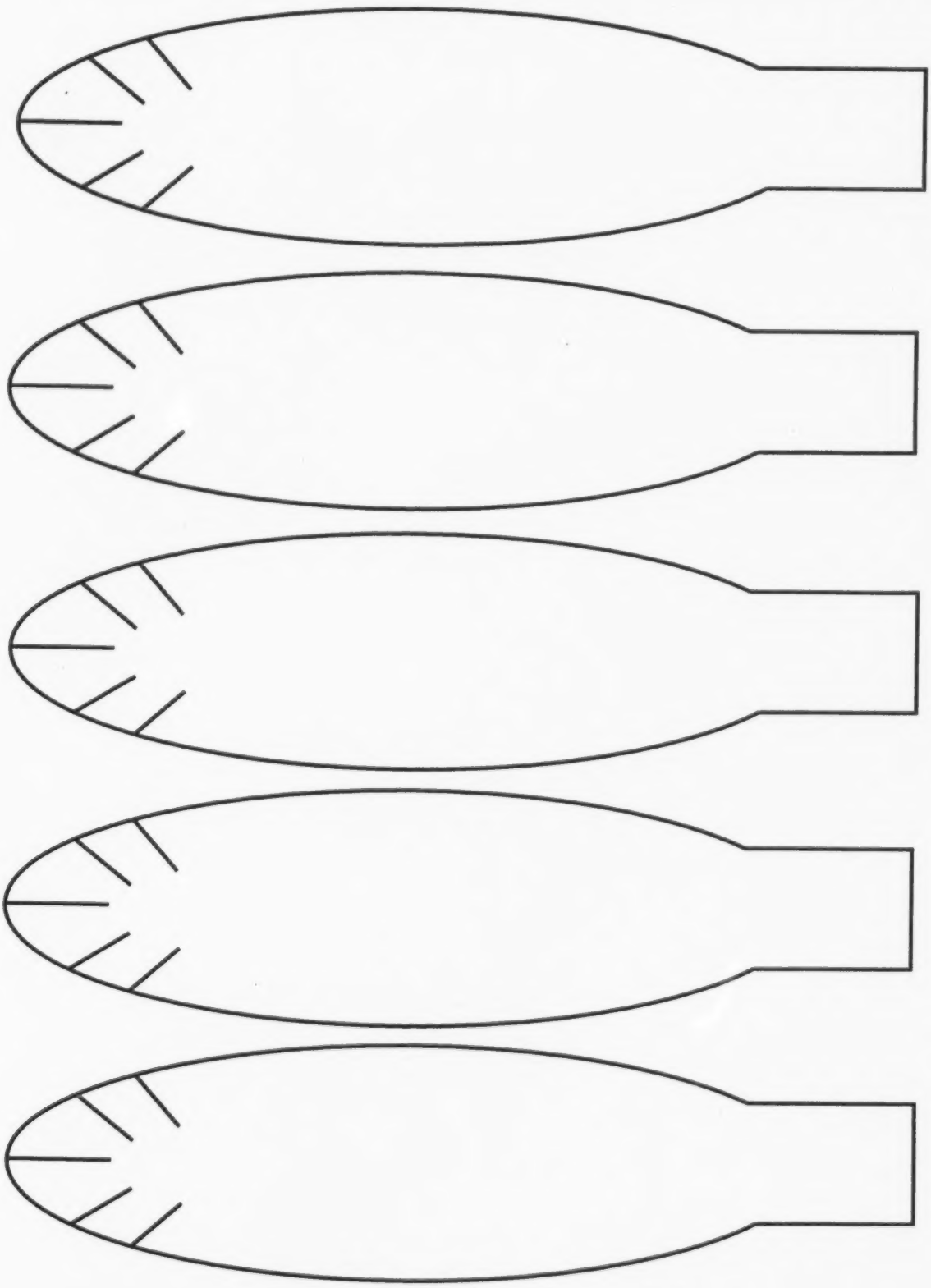

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19. Each row must contain one or more pairs of addends and their sum. Loop the addends and sum. Loops may overlap. Have students point or orally describe the pairs that make the sum.

VARIATION: Use subtraction facts.

VARIATION: Write rows of numbers where students are able to see them, such as on an overhead or the chalkboard.

1	2	3	5	7	6	2	8	3	2
5	2	7	8	1	9	1	0	1	1
4	1	3	6	9	8	0	8	5	7
3	1	4	2	6	1	7	2	9	6

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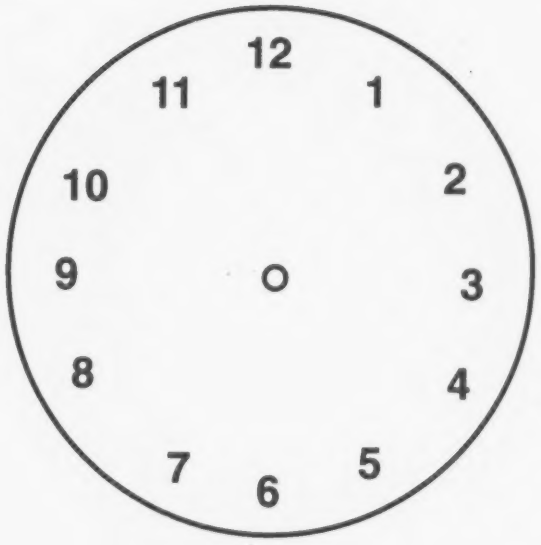
20. Work with a partner. One student is to pick two numbers on the clock that are opposite each other (like 3 and 9). Say: "Add the two numbers and only tell me the sum. I'll tell you the addends!"



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21. You will need two cubes numbered 1 through 6. Students may work in pairs or small groups. Each player writes the numbers 2–12 on a piece of paper. Player 1 tosses the cubes and crosses out the sum of the two numbers showing on top. This player will continue tossing, adding, and crossing out sums as long as the sums appear on that player's paper. When no new sums appear after three tosses, Player 2 plays the game by tossing, adding, and crossing out sums that appear on Player 2's paper. The game continues until all players have a turn. The player with the most crossed out sums wins.

22. You will need cards, each with a number from 1 through 10 (see pages 10–12) and cards with addition or subtraction facts written on them where the sum is 10 or less (use blanks on page 13). Distribute the number cards to students in various places in the classroom. These cards represent mailboxes. A volunteer will deliver the mail to the appropriate mailboxes by solving the problems on the "letters." For example, the "letter" 7 – 3 = ___ will be delivered to "mailbox" 4.

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23. The students pick two single-digit addends, and the teacher picks three. Announce that the sum of all five addends will be 26 (this can vary to other values in the 20s). Be sure to select a value which, when paired with a student's selection, gives the sum of 9. The remaining teacher selection is two more than the ones digit of the sum and is predetermined as the "magic" number.

NOTE: The students need to pick first; although if pressured, the teacher can select the magic number first.

VARIATION: Extend to more addends.

24. Write any 3-digit number. Reverse the 3 digits. Add these two numbers. If the sum can be read the same way both backwards and forwards, it is a palindrome. If not, continue the process by reversing the digits of the sum and adding it to the preceding sum. Continue until a palindrome appears.

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25. Work with a partner. Take turns calling out a number 1–6. As each number is called out, add it to the previous sum. The first player to reach 50 wins.

NOTE: This is a possible place for calculator use.

26. A player calls out, "I have 3 numbers whose sum is 10. One of them is 4 and another is 2. What is the other number?" The individual or team that is correct becomes "it."

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27. Work with a partner. One person picks a number from a point of a star. The other person tries to guess what it is. Ask which star or stars the number appears in. "Is it located in Star 1 or Star 2 or... ?" For example, if the number was in Star 1, Star 3, and Star 4, the secret number would be 8 because the sum of 1, 3, and 4 is 8.

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28. Write your age. Add 90 to it. Cross off the first digit and add it to what is left. Subtract 9 from this number (if you are over age 10, add 9 rather than subtracting). What do you get?

29. Choose a number. Multiply it by 100. Subtract the original number. Add the digits. What do you get?

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30. Write your age. Multiply your age by 3. Add 1. Multiply by 3. Add your age. What did you get? Cross off the last digit of that number, and you'll have your age.

31. Write your number of family members. Add 14. Subtract 7. Add 93. Call on a student to announce the final number. Secretly subtract 100 from the final number to get the number of people in the student's family.

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32. Write a number. Add 6. Multiply the sum by 2. Subtract the original number. Subtract the original number again. Subtract 8. What do you get?

33. Choose any number. Multiply that number by 2. Add 5. Multiply by 50. Subtract 365. Add another number. Add 115. What do you get?

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34. Pick a number. Add 4. Subtract 3. Add 5. Subtract 3. Add 2. Subtract 5. What did you get?

35. Choose a 2–digit number with the first digit greater than the second. Reverse the digits and subtract. Reverse the digits and add. What did you get?

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36. The code below assigns a number value to each letter of the alphabet. Form the shortest word with the greatest value.

VARIATION: Form the sum of the letters in the weekly spelling, reading, or science vocabulary list.

POINTS:	LETTERS:				
1	A				
2	E	K	O	T	N
5	B	I	R	S	U
10	C	D	G	H	M
20	F	P	V	W	Y
25	J	K	Q		
30	X	Z			

37. Find a word worth $ 0.60 when A = $0.01, B = $0.02, C = $0.03, etc.

VARIATION: Find the value of your first name and last name.

VARIATION: Compare values for most or least.

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38. The teacher says a number, such as nine, and writes the word "nine" on the board. Students must say a number that begins with the letter "e," such as eleven, because nine ends with an "e." Each word that is played is written on the board. The game continues until no one can think of another number.

VARIATION: Specify odds, evens, multiples, etc.

39. Secretly assign each student in the group one of the following animals: snake, spider, centipede, penguin, zebra, butterfly. The other students are to guess each student's animal by asking only one question, which may not be, "Which animal are you?"

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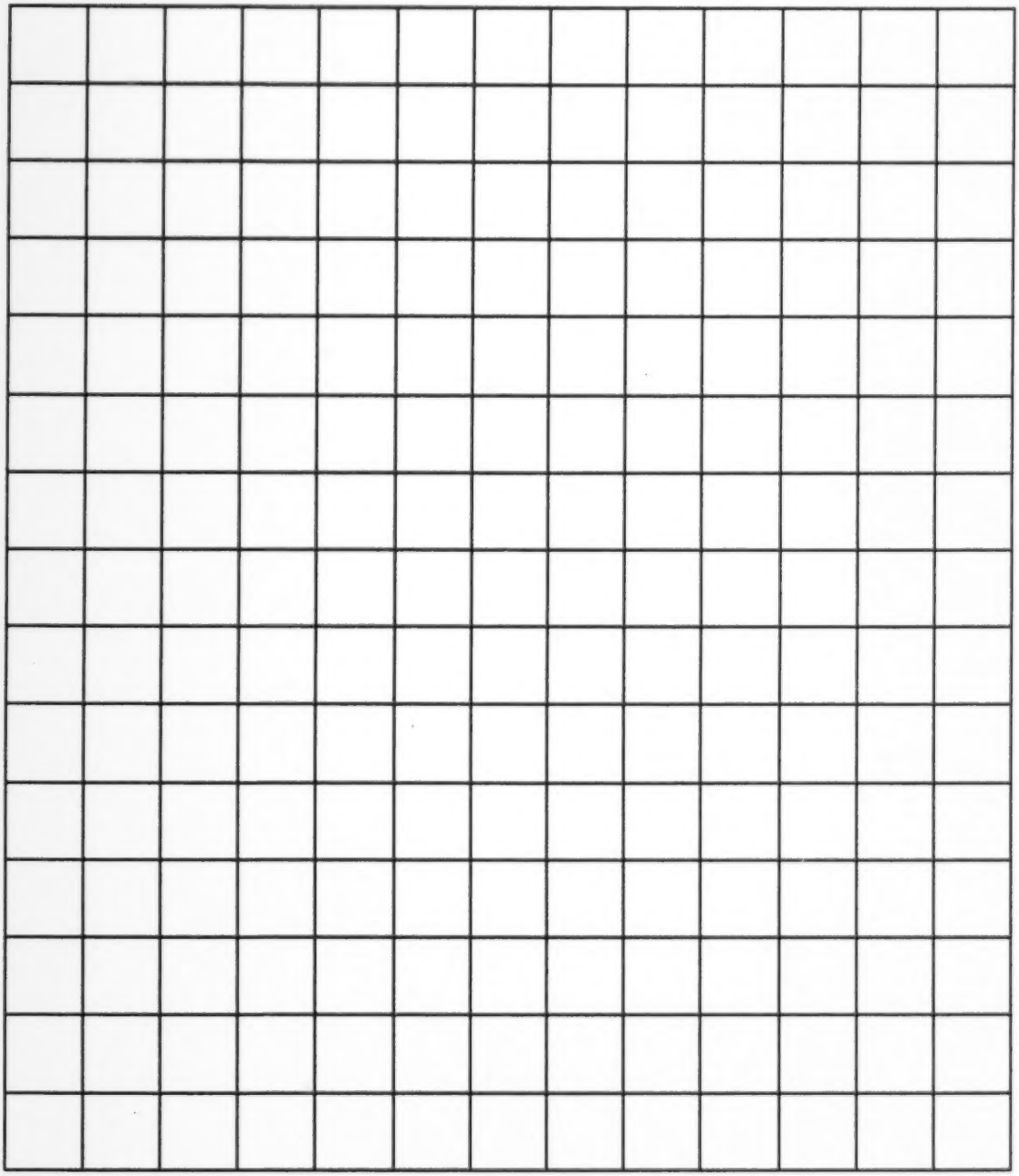
40. Work with a partner. One player will be "X" and the other, "O." Take turns marking Xs and Os in the squares on the grid. The first player to get 5 in a row is the winner. The five may be either horizontal, vertical, or diagonal.



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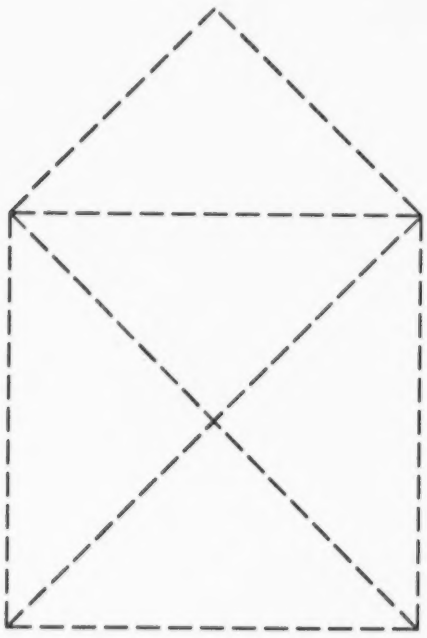
41. Draw or trace the shape below without lifting your pencil.



42. Show that 6 is half of eleven.

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43. Player 1 thinks of a mathematical term or phrase and draws a blank line segment for each letter. Other players take turns guessing the missing letters. If the letter guessed is in the word, write that letter on the appropriate blank. If the letter is not in the word, Player 1 draws a head on the gallows below. Draw other body parts for each wrong guess (hat, head, neck, body, arms, legs, hands, feet). To win, try to guess the word or phrase before the hanging victim is completely drawn.

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44. Which would be heavier—a pound of bricks or a pound of paperclips?

45. What will come next? Explain you answer.
X O X X O O X X X

46. What number does this represent? TTTTTTTT

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47. What number does this represent? TTTT

48. What number does this represent? TTTTTT 9

49. What will come next? Explain how you knew.

Anthony, Barbara, Corrie, Debby, _____ .

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50. What will come next? Explain how you knew.

apples, beans, corn, _____ .

51. What will come next? Explain how you knew.

2, 4, 6, _____ .

52. What will come next? Explain how you knew.

rose, bread, daisy, carrot, _____ .

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53. What will come next? Explain how you knew.

20, 30, 40, 10, 12, 18, 24, _____ .

54. What will come next? Explain how you knew.

dog, bird, tiger, osprey, _____ .

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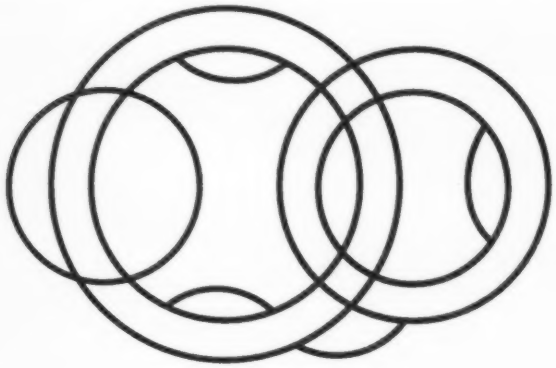
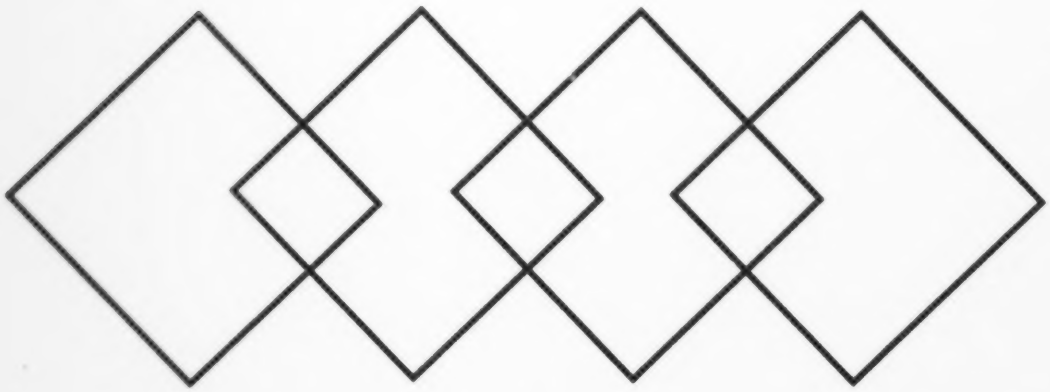
GEOMETRY HUNT

55. Count the circles in the drawing.



56. Count the squares in the drawing.



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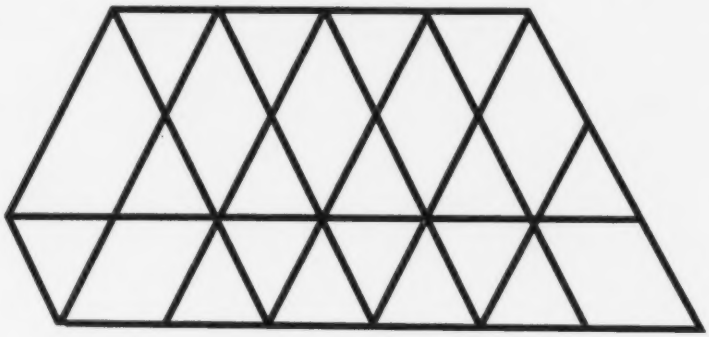
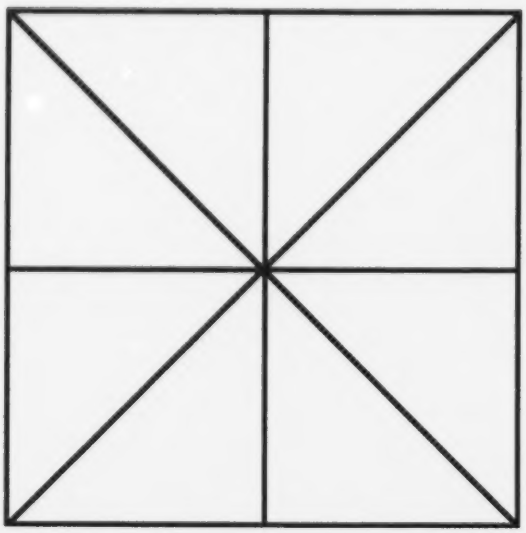
57. Count the triangles in the drawing.



58. Count the squares and triangles in the drawing.



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59. Match Game: You will need 36 cards for each game. Lay the cards on a flat surface to from a 6 x 6 array. (For younger children, it is helpful to outline cards on a poster board so they know where to put the cards.) Players take turns turning over 2 cards. If there is a match, the player removes the cards and continues until no match is made. The player with the most cards at the end of the game wins. Suggested cards: math facts; geometry pictures and number of sides on polygons; analog and digital time; vocabulary words and definitions; expanded notation and standard form; place value blocks and standard numbers.

60. Form students into two facing lines. Give a bean bag to one student. That student states a number fact and tosses the bean bag to a person on the other team. The receiving person must give the answer to the problem. A correct answer results in a point for the team. The team reaching a specified total is the winner. No student may answer more than 2 problems until all members of the team have had an opportunity.

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SOLUTIONS

1. Fact family for 3, 4, 7: 3 + 4 = 7, 4 + 3 = 7, 7 – 4 = 3, 7 – 3 = 4

2. Varies

3. Varies

4. Varies

5. Varies

6. A fast strategy for finding the number is always to take half of the remaining set. Suppose the chosen number is 65. Guess 50; too small (so you know the number is between 50 and 100). Guess 75; too big. Guess 63 (the choice is either 62 or 63); too small. Guess 69; too big. Guess 67; too big. Guess 65; GOT IT! Using this routine, you will always get the number in no more than 7 tries.

7. Varies

8. Varies

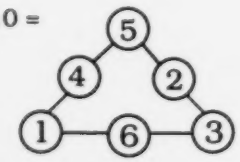
9.

	3	5	
7	1	8	2
	4	6	

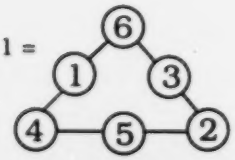
10. Varies

11. Varies

12. 10 =



11 =



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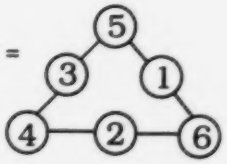

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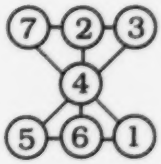

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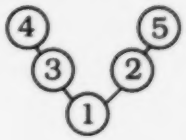

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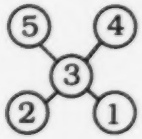


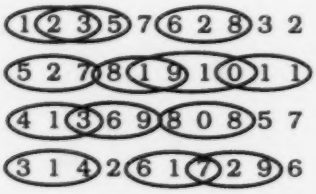
16.

2	9	4
7	5	3
6	1	8

17. Varies

18. Varies

19. Addition



20. Sum of 12 (3 + 9); sum of 18 (12, 6); sum of 10 (8, 2); sum of 8 (1, 7); sum of 14 (10, 4); sum of 16 (11, 5).

21. Varies

22. Varies

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23. The teacher selects a value which, when paired with a student selection, gives a sum of 9. The remaining teacher selection is 2 more than the ones digit of the sum and is predetermined as the magic number. Note that students need to pick first; although, if pressured, the teacher can select the magic number first. This can be extended to more addends. The example here had two 9s in the problem when the sums were found. If there were three 9s in the problem, then the answer would be in the 30s and the magic number would be 3 greater than the ones digit of the sum.

24. 213 + 312 = 525 (palindrome)

762 + 267 = 1029

1029 + 9201 = 10230

10230 + 03201 = 13431 (palindrome)

25. The person saying 1, 8, 15, 22, 29, 36, 43 is guarenteed to win until the opponent catches on that only 43 needs to be used. A win can be guaranteed by selecting an earlier value in the sequence and then using each subsequent one.

26. Varies

27. Varies

28. The player's age

29. You always get 18.

30. The player's age

31. Subtract 100 from the final answer to get the number of people in student's family. 105 – 100 = 5

32. You always get 4.

33. The result will contain the number the student started with and the last number chosen.

34. The original number

35. You always get 99.

36 Varies

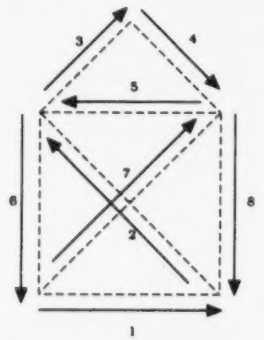
37. Varies

38. Varies

39. How many legs do you have?

40. Varies

41.



42. The Roman numeral XI = 11. Cover the bottom half of that numeral, and you'll see the Roman numeral VI, which equals 6.

43. Varies

44. They would both weigh a pound.

45. 0 0 0

46. Ninety = nine T

47. Forty = four T

48. Seventy-nine

49. Any name that begins with the letter "E"

50. Any food that begins with the letter "D"

51. 8 (skip counting by 2)

52. Any flower

53. 6. It is the largest common factor of

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the three preceding numbers (as 10 was the largest common factor of 20, 30, 40).

54. Any animal spelled with seven letters, or an animal that does not fly

55. 5

56. 7

57. 36

58. 5 squares

16 triangles

59. Varies

60. Varies

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